UAS Traffic Management (UTM)

Completed Technology Project (2015 - 2021)

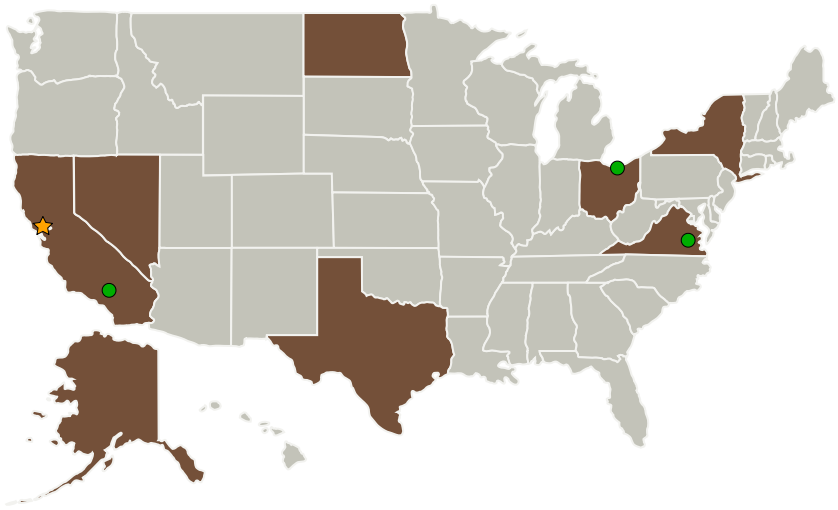
Project Introduction

Unmanned Aircraft Systems (UAS) Traffic Management (or UTM) develops and validates airspace operational and integration performance requirements to enable safe, large-scale UAS operations in low-altitude airspace.

Anticipated Benefits

UTM will provide guidance and a set of validated requirements including a proof-of-concept prototype for managing low-altitude airspace in a safe and efficient manner that will be designed to be compatible with existing and expected future systems and regulations. UTM is predicted to have a large impact on facilitating the improvement of the certification process by the FAA.

Primary U.S. Work Locations and Key Partners



UAS Traffic Management

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
AirMap	Supporting Organization	Industry	
Amazon	Supporting Organization	Industry	
ANRA Technologies	Supporting Organization	Industry	Tysons, Virginia
●Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California
Collins Aerospace	Supporting Organization	Industry	Cedar Rapids, Iowa
Federal Aviation Administration(FAA)	Supporting Organization	US Government	Washington, District of Columbia
General Electric Company	Supporting Organization	Industry	Niskayuna, New York
●Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio
Google Inc.	Supporting Organization	Industry	Mountain View, California
Intel Corporation	Supporting Organization	Industry	
●Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia
Simulvze	Supporting	Industry	

Organizational Responsibility

Responsible Mission Directorate:

Aeronautics Research Mission Directorate (ARMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Airspace Operations and Safety Program

Project Management

Program Director:

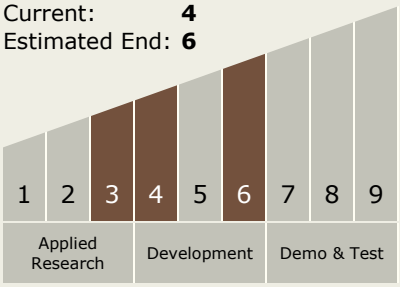
Akbar Sultan

Project Manager:

Ronald D Johnson

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **6**



Technology Areas

Primary:

Continued on following page.

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Primary U.S. Work Locations	
Alaska	California
Nevada	New York
North Dakota	Ohio
Texas	Virginia

Project Transitions

October 2015: Project Start

September 2021: Closed out

Closeout Summary: The Unmanned Aircraft Systems (UAS) Traffic Management (or UTM) project closed out in May 2021. The project resulted in concepts, documentation, data, and a set of software prototypes for enabling access to low altitude airspace for small (less than 55 pounds) UAS. UTM provided guidance and a proof-of-concept for managing this airspace in a safe and efficient manner that was designed to be compatible with existing and expected future systems and regulations. The UTM system evolved through a series of Technical Capability Levels (TCL) to progressively add features and operational complexity to define the system components, roles and responsibilities of participants, technology needs, and safety considerations. The first TCL (TCL 1) established requirements for multi-vehicle visual line of site (VLOS) such as airspace management, geo-fencing, and user authentication. The second TCL focused on rural area beyond visual line of sight (BVLOS) and support multi-segment, longer range operations, altitude separation, conformance monitoring, weather checking and initial contingency management. The third TCL addressed the challenges of suburban operations including separation management requirements and the fourth TCL focused on urban operations including large-scale contingency management capability requirements. These TCLs were tested in collaboration with external and government partners. The UTM project coordinated as necessary its research and development activities (in-house, NRAs, SBIRs) with the other projects in AOSP, other programs and projects within ARMD, and other non-ARMD programs and projects, and collaborated with academia, industry, and other government agencies to leverage their expertise and technological advances in this field.

Project Website:

https://utm.arc.nasa.gov/

Technology Areas *(cont.)*

- TX16 Air Traffic Management and Range Tracking Systems
  - TX16.1 Safe All Vehicle Access

Other/Cross-cutting:

- TX16 Air Traffic Management and Range Tracking Systems
  - TX16.3 Traffic Management Concepts

Target Destination

Earth